

Grinstead Dr

Project Purpose, Scope, Approach, Budget & Timeline

The purpose of this project is to reduce the vehicle collision rate and improve cycling facilities along Grinstead Dr between Peterson Ave and Stilz Ave by reconfiguring the roadway cross-section to one vehicular travel lane in each direction and a two-way left turn lane without significantly increasing travel time or congestion. The reconfigured cross-section improves safety by eliminating conflict points at the intersections and along the route and reduces the average vehicle speed within acceptable ranges of the posted speed limit. The excess pavement from the removed lane can then be used to provide an additional buffer for cyclists by separating the bicycles from the vehicle travel lanes. This project is to be completed as part of the Grinstead resurfacing project scheduled for early Summer 2014.

The changes to Grinstead Dr being proposed with this plan are as follows:

1. Remark the existing 4-lane road to provide two 10' travel lanes, a 10' center two-way left turn lane and 5' bike lanes near the curb. This will apply on the section of Grinstead between Peterson and Crescent Ct.
2. Provide a dedicated left turn lane from east-bound Grinstead to Peterson Ave, this serves as the lane drop in the east-bound direction.
3. Remark Grinstead Dr from Crescent Ct to the Stilz Ave intersection with two 12' travel lanes and 8' parking lanes.
4. Grinstead at Stilz Ave will be remarked as a 12' left turn lane with a 4' left bike turn lane, and a 12' combination right turn lane & thru lane.
5. A climbing lane for cyclists is also planned for Stilz Ave between Grinstead Dr and Frankfort Ave, adjacent to the north-bound drive lane, within the parking restricted area.

To rate the success of this proposed project, a series of measures have been established that will provide a clear comparison between the pre-project and post-project traffic characteristics. The methods used to measure the effectiveness of this project have been detailed in this document and includes the following:

1. Collision study to determine the change in number and type of collisions
2. Speed studies to determine changes in prevailing speeds and percentage of drivers that are "excessive speeders" (10 mph or more above the posted speed limit)
3. Traffic counts and travel time studies to determine change in traffic volumes, lane utilization and traffic delays
4. Bike counts to determine change in ridership

Budget:

This project, funded thru Mayor Greg Fischer's Urban Bike Network allocation established in the 2014 Fiscal Year budget, will be incorporated into the resurfacing of Grinstead Dr in order to reduce the overall cost of the treatment and to provide a higher quality facility. In doing so, the cost to remove the existing markings, about \$6,700, is no longer necessary.

Cost

Solid 4" paint =	12,280	ft @	\$0.16	per ft =	\$1,965
Solid 6" thermo =	9,780	ft @	\$0.64	per ft =	\$6,259
Thermo bike symbol 9C-3B =	46	ea @	\$130.00	per ea =	\$5,980
Thermo sharrow symbol 9C-9 =	30	ea @	\$130.00	per ea =	\$3,900
Thermo LEFT curve arrow =	39	ea @	\$89.00	per ea =	\$3,471
Thermo "ONLY" text =	2	ea @	\$240.00	per ea =	\$480
TOTAL					\$22,055
plus 10%					\$24,300

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Measurements of Effectiveness

1. Collision Study:

To determine the effectiveness of the roadway treatments in improving the collision rates, a comparison of the collision types occurring before and after the improvements will be conducted. The collision history for the last three years will be gathered through the Kentucky State Police's Collision Data website. Queries will be conducted in accordance with the *Collision Reporting Guideline* and the data obtained will be ranked by Manner of Collision and Directional Analysis. Each type of collision will then be converted to a specific collision type per vehicle mile traveled using the current traffic volumes for this section of roadway.

Upon completion of the road reconfiguration project, collisions within the boundary of the project will be evaluated monthly for the first 6 months in order to identify any immediate deficiencies. After the first 6 months, collisions will then be evaluated every 6 months for 3 years. Once the three years of collision history has been gathered, a comparison can be made between the pre- and post-project collision rates to determine effectiveness.

The road reconfiguration should show improvements in the number of sideswipe (same & opposite direction) and single vehicle collisions in which the vehicle left the roadway and collided with a fixed object. There should also be modest reductions in the rate of opposing left turn and rear end collisions since the total number of conflicts will be reduced. There should also be no increase in the number of cyclist and pedestrian related collisions despite an increase in the total number of users.

Collision Analysis:

The collision history for this section of road was obtained through the Kentucky State Police's public crash analysis website. A query was conducted using the values listed in the attached collision report spreadsheet and the narrative of each report from 2011 to 2013 was analyzed to determine the type of counter measure that would be best suited to reduce or eliminate each collision.

Collision History for:

Grinstead Dr from Stilz to I-64 interchange

(Top 4 Collision Types)

Manner of Collision	Total # of Collisions	Total # of Injuries	Total # of Correctable Collisions	Total # of Correctable Injuries
ANGLE	9	0	2	0
REAR END	9	0	2	0
SINGLE VEHICLE	6	1	1	0
SIDESWIPE-SAME DIRECTION	4	0	1	0

Total Collisions **28**

Total Injury **1**

Total # of Correctable Collisions **6**

Total # of Correctable Injuries **0**

% Reduction in Collisions **12%**

% Reduction in Injuries **0%**

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2. Traffic Counts, Travel Time, & Speed Studies:

To determine the effectiveness of the roadway treatments and its impact to the traffic flow and volumes, several pre- and post-project traffic counts and travel time studies will be conducted. Comparisons will be made between the before and after counts to determine the total change in traffic volume utilizing this section of road, the change in the average and 85th percentile speed, and the change in the travel time and delay. The data gathered during the pre-project surveys will also be used to calibrate the traffic simulation models for the project corridor.

A travel time and delay study will be conducted in accordance with the Travel Time Study Guidelines, and will be used to determine the impact the road reconfiguration has on the quality of traffic movement along the route.

Pre-project traffic counts -

Count 1:

Location: near Birchwood, both west-bound travel lanes

Equipment: (2) NC-200 Traffic Analyzer

Dates: Thursday, April 17, 2014 11:45am thru Friday, April 18, 2014 11:45am

Data: This will be a traffic volume and speed count for 24 hours, with one counter in each lane of travel. This count will establish an Average Daily Traffic volume in each lane and the average and 85th percentile speeds.

Results:

Outside travel lane:

201 ADT with 40.0 mph 85th percentile

Inside travel lane:

3,367 ADT with 41.4 mph 85th percentile

Combined:

3,568 ADT with 41.4 mph 85th percentile

Count 2:

Location: near Birchwood, both east-bound travel lanes

Equipment: (2) NC-200 Traffic Analyzer

Dates: Tuesday, April 15, 2014 10:00am thru Wednesday, April 16, 2014 10:00am

Data: This will be a traffic volume and speed count for 24 hours, with one counter in each lane of travel. This count will establish an Average Daily Traffic volume in each lane and the average and 85th percentile speeds.

Results:

Outside travel lane:

529 ADT with 41.9 mph 85th percentile

Inside travel lane:

2,661 ADT with 42.7 mph 85th percentile

Combined:

3,190 ADT with 42.6 mph 85th percentile

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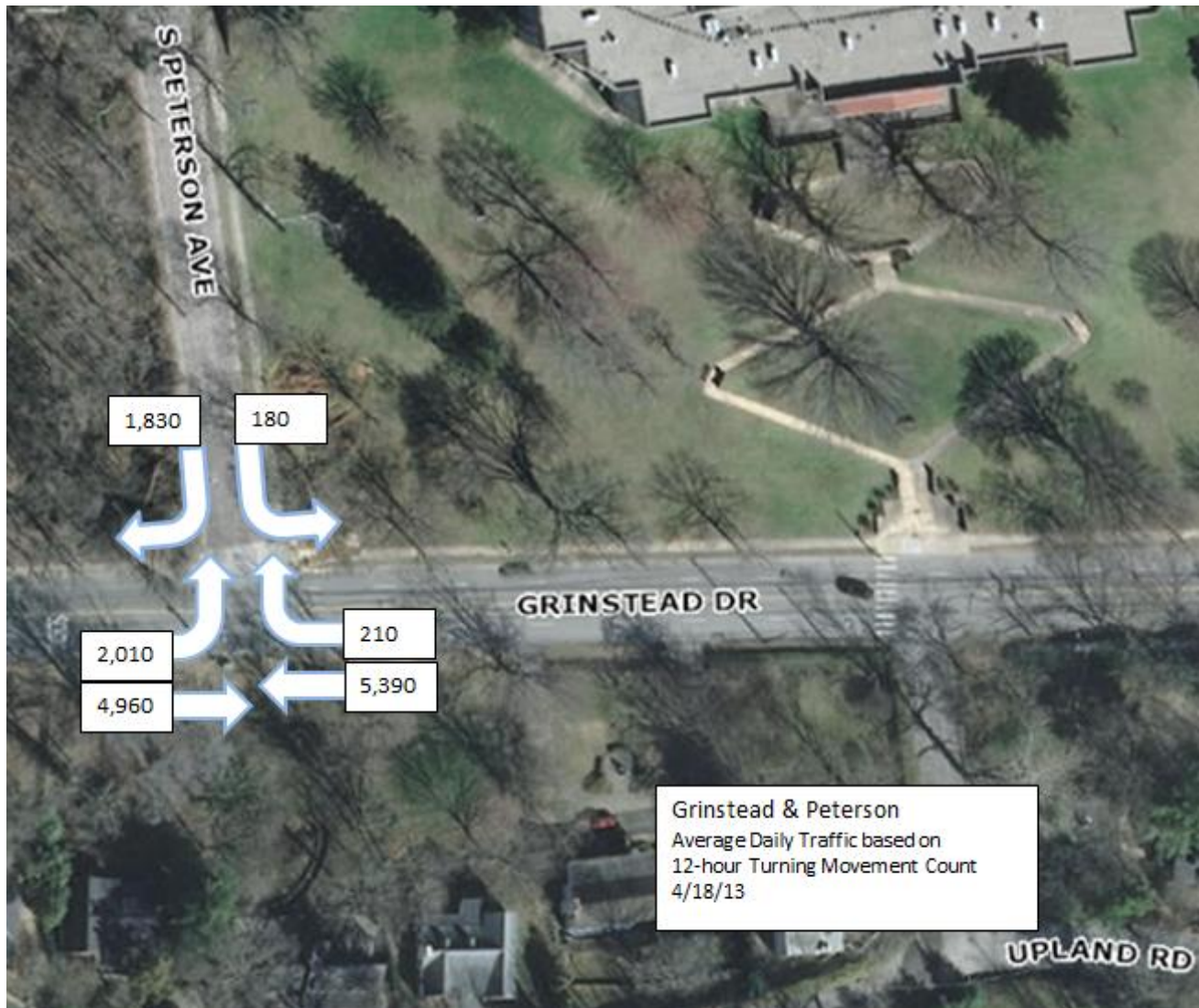
Count 3:

Location: Grinstead Dr & Peterson Ave intersection

Equipment: Mio-Vision

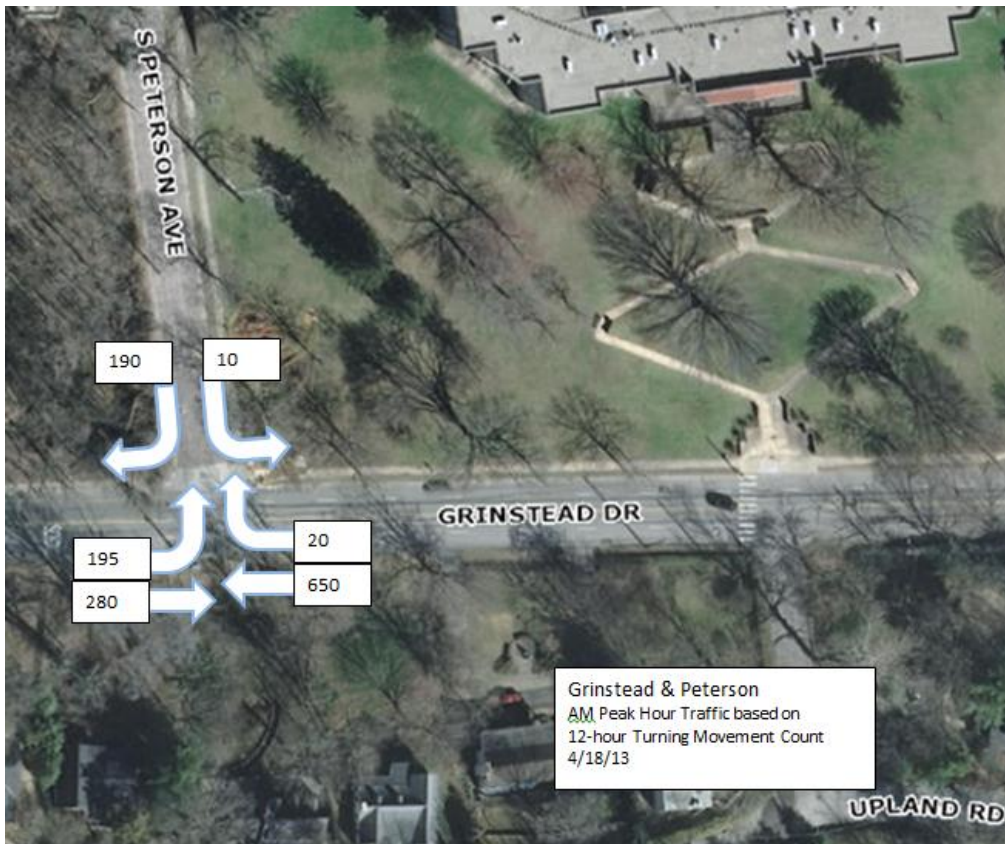
Date: 12-hour count conducted 4/18/2013

Data: This will be a 12-hour turning movement count at the unsignalized intersection.



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3. Bike counts & ridership:

To determine the effectiveness of the bike lanes, counts will be conducted before and after the project. This before and after comparison will demonstrate the change in ridership associated with the dedicated bike lanes.

Pneumatic tube counters will be placed at several locations to gather data on the total number of cyclists traveling in each direction in the corridor. Each count will be about 2 weeks and during more favorable weather conditions.

Pre-project bicycle counts -

Count 1:

Location: Grinstead near Birchwood, east-bound direction, outside lane only

Equipment: Eco-Combo #2696

Dates: Monday, April 14, 2014 thru Monday, April 28, 2014

Post-project counts shall be conducted at the above locations several months after the completion of the project to compare the change in ridership along this section of road. Annual counts will be conducted and the data extracted will be used to establish trends in ridership along Grinstead Dr. Data extracted from future counts will also be used in extrapolating the latent demand that may exist in other areas of the city to aid in the design of future road reconfiguration projects.

Bike Count Summary:

Eco-Combo #2696	
Date	Total
4/14/2014	8
4/15/2014	1
4/16/2014	16
4/17/2014	22
4/18/2014	19
4/19/2014	28
4/20/2014	23
4/21/2014	27
4/22/2014	30
4/23/2014	30
4/24/2014	17
4/25/2014	16
4/26/2014	26
4/27/2014	16
4/28/2014	10

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Appendix A: Travel Time Study

LOUISVILLE METRO DEPARTMENT OF TRANSPORTATION																		
TRAVEL TIME AND DELAY STUDY FIELD SUMMARY																		
ROADWAY I.D.:								LOCATION: Grinstead Drive: Lexington to Stilz										
CITY: Louisville								COUNTY: Jefferson										
DATE: 3/26/14				WEATHER: Cold				OBSERVERS: C. Allen, D. Gowin										
CONTROL POINT	MILES	RUN NUMBER												AVG. TRAVEL TIME	AVG. TRAVEL SPEED	AVG. DELAY	AVG. RUNNING TIME	AVG. RUNNING SPEED
		1		2		3		4		5		6						
		TRAVEL TIME	DELAY	TRAVEL TIME	DELAY	TRAVEL TIME	DELAY	TRAVEL TIME	DELAY	TRAVEL TIME	DELAY	TRAVEL TIME	DELAY					
0	0.7	105	27	125	46	114	42	187	99	60	0	157	82	124.6 sec	20.2 mph	49.3 sec	75.3 sec	33.5 mph
1																		
1	0.5	48	0	45	0	48	0	73	19	47	0	48	0	51.5 sec	35 mph	0	51.5 sec	35 mph
2																		
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TOTALS	2.2	153	27	170	46	162	42	260	118	107	0	205	82					
RUNNING TIME		126		124		120		142		107		123						
TOTAL TRIP LENGTH = 2.2 miles				AVERAGE TOTAL TRAVEL TIME = 176.1 secs						AVERAGE TOTAL TRAVEL SPEED = 44.9 mph								
AVERAGE TOTAL TRIP DELAY = 49.3 secs				AVERAGE TOTAL RUNNING TIME = 126.8 secs						AVERAGE TOTAL RUNNING SPEED = 62.5 mph								